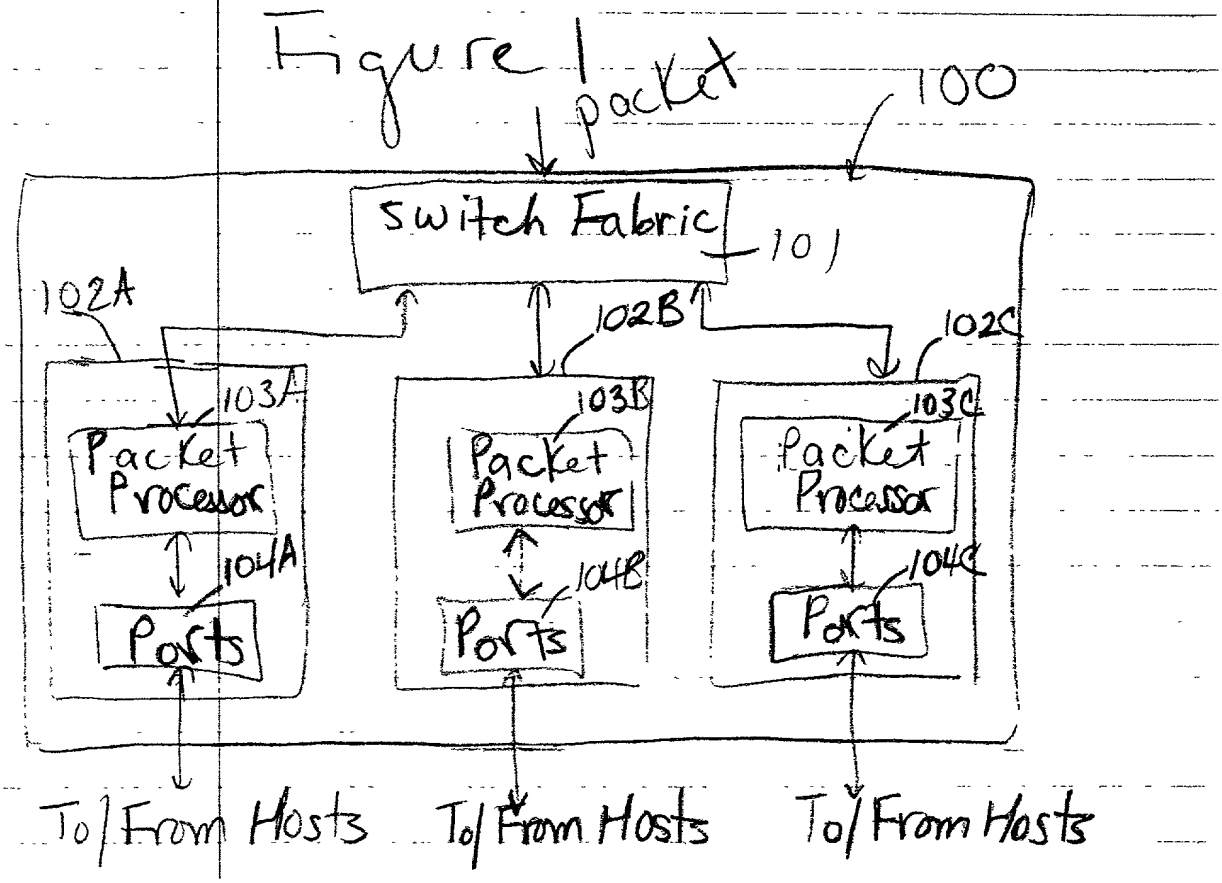


Figure 1
packet
100
switch Fabric
101
102A
102B
102C
103A
103B
103C
Packet Processor
Packet Processor
Packet Processor
104A
104B
104C
Ports
Ports
Ports
To/From Hosts
To/From Hosts
To/From Hosts

Figure 2

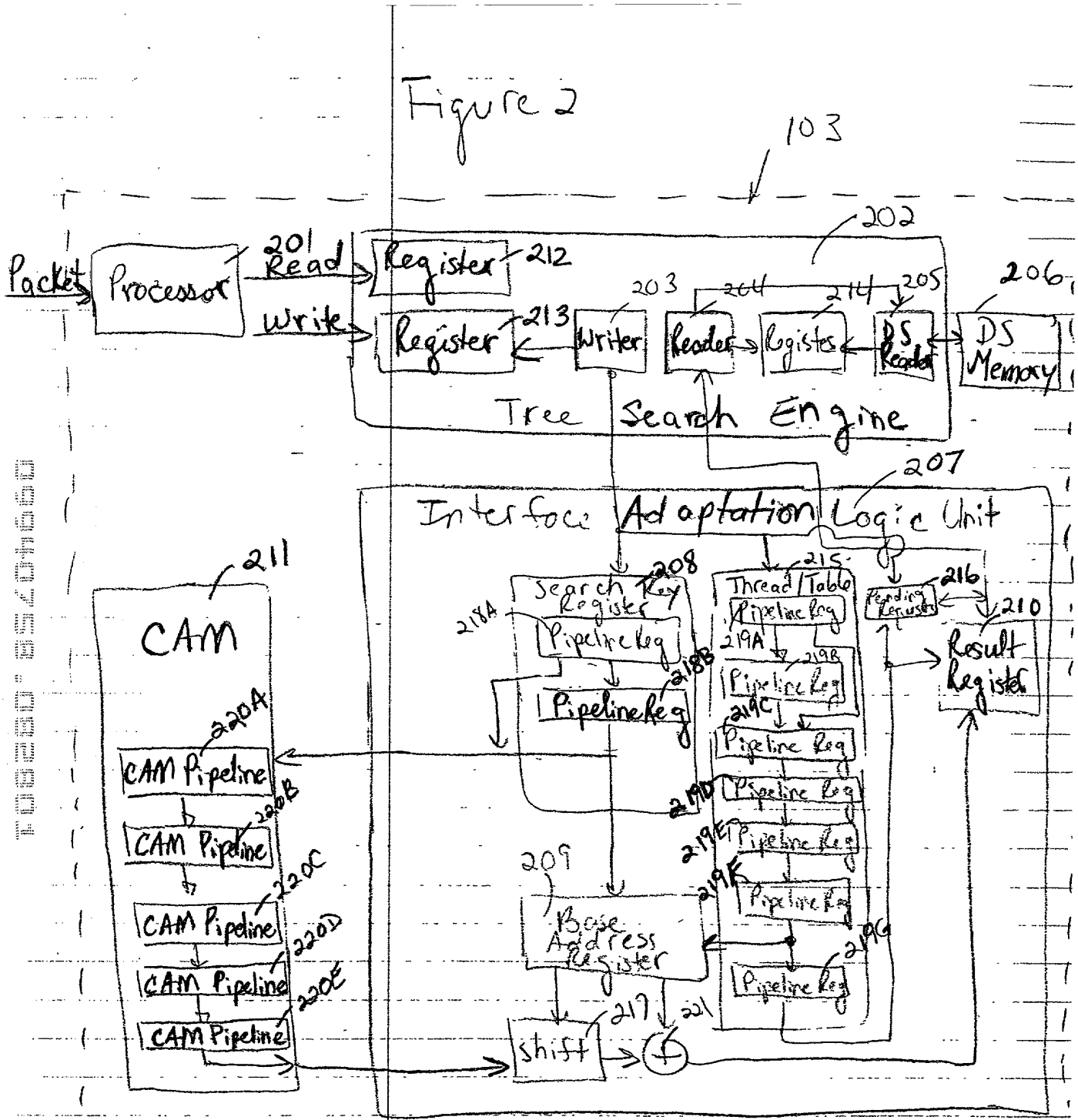

103
202
Packet
Processor
201
Read
Write
Register
212
Register
213
203
Writer
204
Reader
214
Register
205
DS Reader
206
DS Memory
Tree Search Engine
207
Interface Adaptation Logic Unit
211
CAM
220A
CAM Pipeline
220B
CAM Pipeline
220C
CAM Pipeline
220D
CAM Pipeline
220E
CAM Pipeline
208
Search Key Register
218A
Pipeline Reg
218B
Pipeline Reg
215
Thread Table
Pipeline Reg
219A
219B
Pipeline Reg
219C
Pipeline Reg
219D
Pipeline Reg
219E
Pipeline Reg
219F
Pipeline Reg
219G
Pipeline Reg
216
Pending Requests
210
Result Register
209
Base Address Register
217
shift
221
+

FIGURE 3A

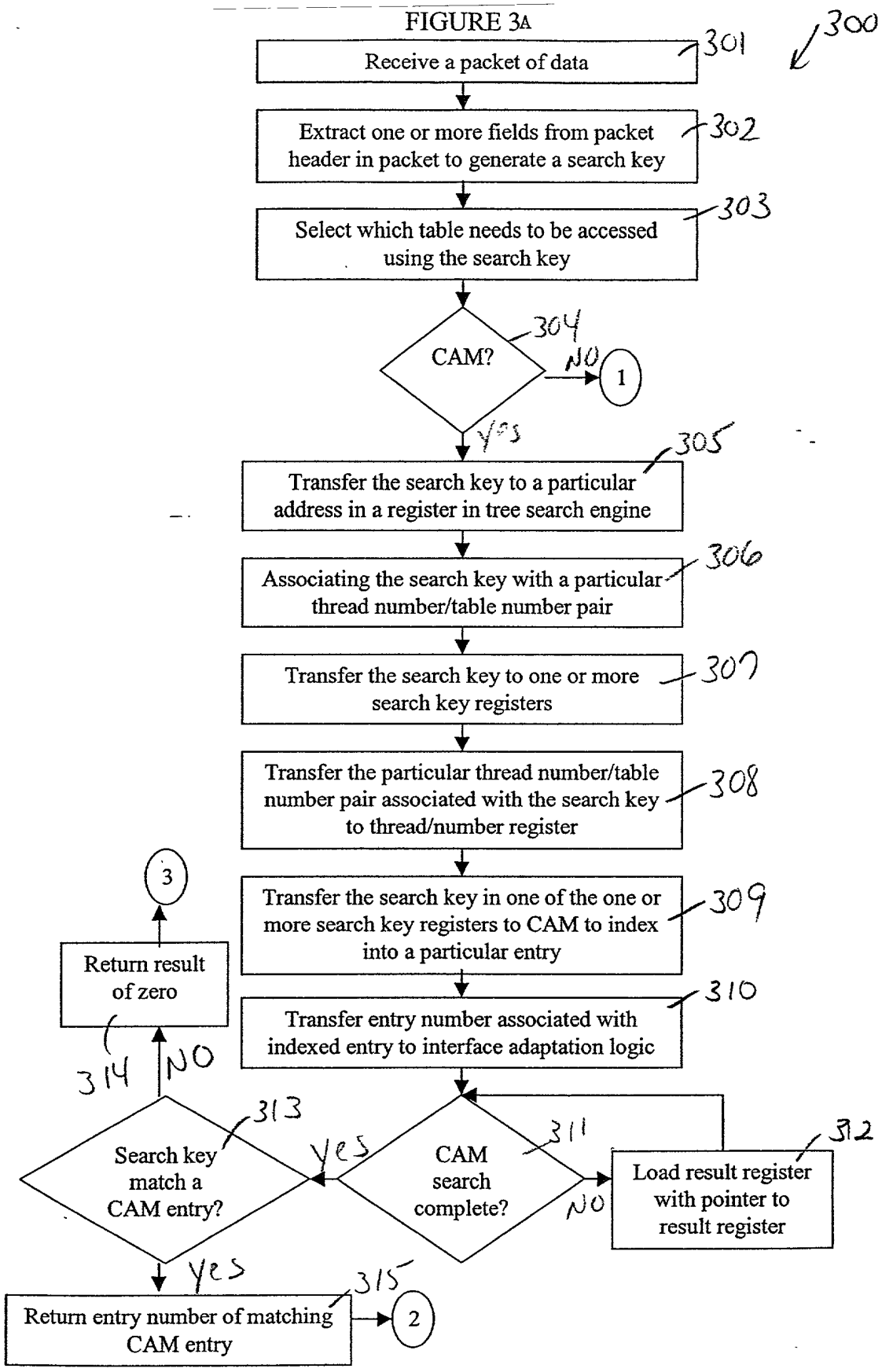

300
Receive a packet of data
301
Extract one or more fields from packet header in packet to generate a search key
302
Select which table needs to be accessed using the search key
303
CAM?
304
NO
1
Yes
Transfer the search key to a particular address in a register in tree search engine
305
Associating the search key with a particular thread number/table number pair
306
Transfer the search key to one or more search key registers
307
Transfer the particular thread number/table number pair associated with the search key to thread/number register
308
Transfer the search key in one of the one or more search key registers to CAM to index into a particular entry
309
Transfer entry number associated with indexed entry to interface adaptation logic
310
CAM search complete?
311
NO
Load result register with pointer to result register
312
Search key match a CAM entry?
313
Yes
Return result of zero
314
NO
3
Yes
Return entry number of matching CAM entry
315
2

FIGURE 3B

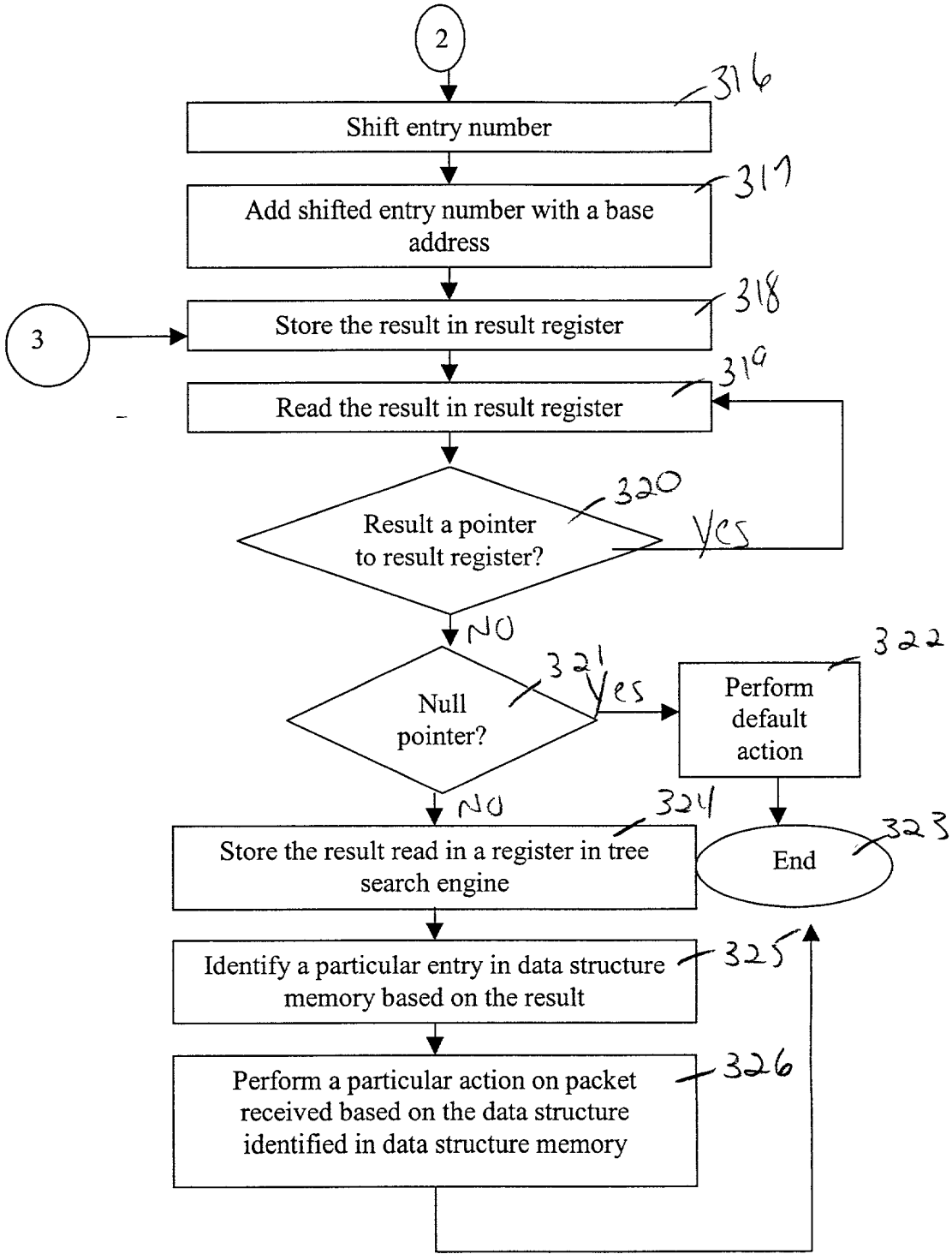
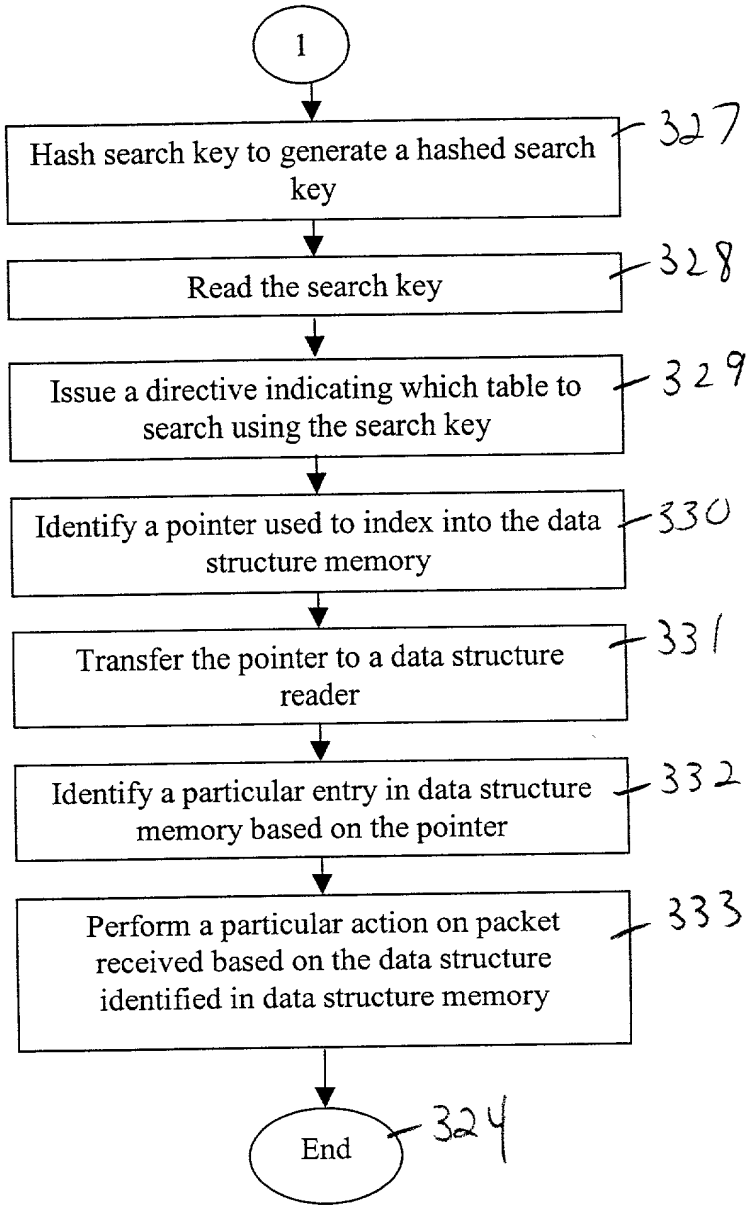

2
316
Shift entry number
317
Add shifted entry number with a base address
318
3
Store the result in result register
319
Read the result in result register
320
Result a pointer to result register?
Yes
NO
321
Null pointer?
Yes
322
Perform default action
NO
324
Store the result read in a register in tree search engine
323
End
325
Identify a particular entry in data structure memory based on the result
326
Perform a particular action on packet received based on the data structure identified in data structure memory

FIGURE 3c


1
Hash search key to generate a hashed search key
327
Read the search key
328
Issue a directive indicating which table to search using the search key
329
Identify a pointer used to index into the data structure memory
330
Transfer the pointer to a data structure reader
331
Identify a particular entry in data structure memory based on the pointer
332
Perform a particular action on packet received based on the data structure identified in data structure memory
333
End
324